

CLAIMS

1. A method for protecting against rollover in a vehicle comprising the steps of:

sensing a lateral acceleration;

sensing a vehicle speed;

sensing a change rate of the steering angle;

determining a rollover tendency of the vehicle based on the lateral acceleration, vehicle speed, and change rate of the steering angle; and

reducing the rollover tendency of the vehicle.

2. The method of claim 1, further comprising the step of providing a database of empiric data including values for a critical change rate of the steering angle corresponding to specific lateral accelerations and specific vehicle speeds.

3. The method of claim 2, further comprising the step of determining a critical change rate of the steering angle based on the lateral acceleration and vehicle speed.

4. The method of claim 3, wherein the step of determining a rollover tendency includes comparing the change rate of the steering angle to the critical change rate of the steering angle.

5. The method of claim 1, wherein the step of determining a rollover tendency includes determining a critical change rate of the steering angle from a

database having critical change rate values corresponding to specific combinations of lateral acceleration and vehicle speed.

6. The method of claim 5, wherein the critical change rate values are empirically determined for the vehicle.

7. The method of claim 5, wherein the step of reducing the rollover tendency includes generating a correction signal based on the change rate of the steering angle and the critical change rate value.

8. The method of claim 1, wherein the step of reducing the rollover tendency includes the steps of generating a correction signal indicative of rollover tendency and sending the correction signal to an actuator for reducing the rollover moment of the vehicle.

9. The method of claim 8, wherein the actuator is a steer-by-wire system, and wherein the steer-by-wire system reduces driver input so the input never exceeds a critical change rate of the steering angle.

10. The method of claim 8, wherein the correction signal has a variable strength.

11. The method of claim 7, wherein the correction signal is generated when the change rate of the steering angle is greater than the critical change rate value.

12. A method of protecting against rollover in a vehicle comprising the steps of:

- detecting a change rate of the steering angle;
- determining a critical change rate corresponding to the vehicle's current speed and the vehicle's current lateral acceleration;
- comparing the critical change rate to the detected change rate of the steering angle to determine a rollover tendency; and
- reducing the rollover tendency of the vehicle.

13. The method of claim 18, wherein the step of determining a critical change rate of the steering angle includes reading from a database having critical change rate values corresponding to specific combinations of lateral acceleration and vehicle speed.

14. The method of claim 18, wherein the step of reducing the rollover tendency includes generating a correction signal indicative of the rollover tendency and sending the correction signal to an actuator for reducing the rollover moment of the vehicle.

15. An active rollover protection system for a motor vehicle comprising:
 - a lateral acceleration sensor providing a first signal indicative of a lateral acceleration of the vehicle;
 - a vehicle speed sensor providing a second signal indicative of a vehicle speed;
 - a steering angle sensor providing a third signal indicative of a change rate of the steering angle;
 - a database having critical change rates values corresponding to specific combinations of lateral acceleration and vehicle speed;
 - a controller receiving the first, second and third signals, the controller determining the critical change rate value corresponding to the first and second signals, the controller comparing the critical change rate value with the third signal to determine a rollover tendency, the controller sending a signal ; and
 - an actuator capable of reducing the rollover tendency, the controller sending a correction signal to the actuator indicative of the rollover tendency.

16. The active rollover protection system of claim 15, wherein the actuator is a brake control system.

17. The active rollover protection system of claim 15, wherein the actuator is an engine control unit.

18. The active rollover protection system of claim 15, wherein the actuator is an active steering system.

19. The active rollover protection system of claim 15, wherein the actuator reduces the rollover moment of the vehicle.

20. The active rollover protection system of claim 15, the correction signal having a variable strength substantially proportional to a comparison between the critical change rate value and the change rate of the steering angle.